



Administrative Checklist for Sediment Control Plan Review

Sediment Control Permit No. _____

Supplementary/Parent/Child Tab:

_____ Document link to Stormwater Management Concept by completing Parent Project # field

Sediment Tab:

- _____ Watershed and Watershed Class
- _____ Maryland State Coordinates
- _____ Maryland Office of Planning Land Use Code
- _____ Private Storm Drain verification, if applicable
- _____ Stormwater Management Waiver information, if applicable
- _____ SPA Acres, if applicable

Fees Tab:

- _____ Stormwater Management Waiver Fees, if applicable
- _____ SPA Fees, if applicable

Conditions Tab:

- _____ Condition – Forest Conservation
- _____ Other Conditions (Floodplain Permit, Special Condition) – add and/or approve, as applicable.

Review Tab:

- _____ Start Review Date
- _____ End Review Date
- _____ Status – Approved

Comments Tab:

- _____ Comments – Use to Document Waiver Information and Special Requirements or Conditions

Log Tab:

- _____ _____ _____ Log – Document Rejections, Request for Information, and Approval

PREPARE FILE FOR SCANNING:

- _____ In accordance with approved standards

STORMWATER MANAGEMENT DATABASE, if applicable



As-Built / Record Drawing Plan Review Checklist

Project Name: _____ Engineer/Phone No. _____

SC Permit No./Revision No. : _____

SWM File No.: _____ Assigned/Phone No. _____

Plan Type: _____

Submittal Date	Review Date	Initial
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Legend:

INC Incomplete/Incorrect
N/A Not Applicable
SC Sediment Control
SWM Stormwater Management
FPDP Floodplain District Permit
DA Drainage Area
SVI Stream Valley Improvements

As-Built Acceptable Date _____

This checklist has been developed to provide specific instruction to engineers. All items are expected to be addressed in the first submittal. Failure to do so may result in less than a full first review.

TO THE ENGINEER:

Your submission for Stormwater Management As-Built Plan approval has been reviewed. The review was made per the following checklist. **Please return the checklist and As-Built plan comment sheets with your resubmittal.** If you do not address a checklist item, including comments on the As-Built plan sheets, explain your reasoning in your transmittal letter.

A. INFORMATION REQUIRED ON THE RED-LINED SEPIAS AND ONE PRINT SET.

- | | | | |
|-------|-------|-------|---|
| _____ | _____ | _____ | Vicinity map on plan sheet. |
| _____ | _____ | _____ | Profile along the centerline of the embankment. |
| _____ | _____ | _____ | Profiles and/or cross sections of the stormwater management facilities with associated details. |
| _____ | _____ | _____ | Elevations of the "water quality", 2, 5, 10, and 100 year storms as appropriate. |
| _____ | _____ | _____ | Profile along the centerline of the principal spillway/outfall pipe extending below the protected outfall or to the downstream manhole structure. |
| _____ | _____ | _____ | As-Built topography and/or dimensions of the stormwater management facility with computations to verify conformance with the approved plan. |
| _____ | _____ | _____ | Establishment of a benchmark on the riser/control structure or inlet headwall to the nearest 0.1-foot. |
| _____ | _____ | _____ | Profile along the centerline of the emergency spillway. |
| _____ | _____ | _____ | Design and As-Built stage-storage table on the plan view sheet. |

____ As-Built information for concept condition items (i.e. SVI, reforestation, grading requirements, bio-sensitive stream crossings, etc. ...)

B. MATERIALS USED

____ The dimensions and type of material for the riser/control structure.

____ The diameter, length, and type of material for the principal spillway, underdrains, and observation/cleanout wells.

____ The size, location and type of trash rack device(s).

____ The number, size and location of the anti-seep collars, precast collars, and cradles as appropriate.

____ Invert, size and length of any low stage orifices and high stage weir crests.

____ Vented/non-vented minimum 30" manhole covers and steps provided for maintenance access.

____ Flow splitter diversion pipe/weir invert, size, and location.

____ Incoming and outgoing storm drain sizes, inverts, and outfall dimensions.

____ Thickness and type of coarse/fine aggregates and planting soil.

____ Filter fabric/geotextile type and location.

____ Landscape/wetland plantings number and location. Include landscape plan with as-built plan set.

C. CERTIFICATIONS

____ Certifications from suppliers for materials used in construction of the facility (principal spillway, control structure, PVC pipe, aggregate, wetland plantings, etc.).

____ Certification statement and seal by a Professional Engineer indicating, "This record drawing is accurate and complete, the stormwater management facilities are constructed per the approved stormwater management plan or subsequent approved revisions, and stormwater management is provided per the approved design computations".

____ Certification statement and seal by a Professional Engineer indicating, "This record drawing is accurate and complete and the pond is constructed as per the approved stormwater management plan or subsequent approved revisions and substantially meets and/or exceeds the requirements of the Soil Conservation Service MD-378 Standards and Specifications for ponds". **(PONDS ONLY)**

____ Geotech's inspection and testing reports verifying that the materials used (i.e. soils, concrete, reinforcing steel, etc.) meet the project specifications of the approved plan.

____ Signed maintenance certification on as-built plan.

D. SUPPORTING DOCUMENTATION

____ Red-lined mylar sepias of the approved plans.

____ Original design computations with corrections/As-Built conditions as necessary.

____ Storage deviation verification (i.e. TR-20 computer run to show adequate storage if the available storage does not agree with the original design storage).

- | | | | |
|-------|-------|-------|---|
| _____ | _____ | _____ | Copy of the completed Inspector Check Off List for each facility. |
| _____ | _____ | _____ | Verify easements, covenants, and any other legal agreements are recorded and in the file. |
| _____ | _____ | _____ | Verify that the stormwater management facility was constructed within the recorded easement area. |
| _____ | _____ | _____ | As-Built memo to MSCD for ponds. |
| _____ | _____ | _____ | Verify structural computations and approved shop drawings are in the file. |
| _____ | _____ | _____ | Completed IF-1 Form. |
| _____ | _____ | _____ | Copy of "Facility Guidelines" completed and placed on the plan. |

D. METHODOLOGY:

1. The above information must be shown in red on a mylar sepia of the approved plan.
2. A red check mark must be made beside design values/items if they were actually the constructed values/items.
3. Elevations to the nearest 0.1-foot are sufficient.
4. Submit plans, supporting information, and computations (two copies) with a transmittal to the Stormwater Management/Sediment Control Section as a formal revision to the original Sediment Control Permit.

ADDITIONAL REQUIREMENTS:

COMMENTS:



Stormwater Management Filtration System Plan Review Checklist

Sediment Control Permit No. _____

SUPPORTING INFORMATION (One Copy)

- _____ Stormwater Management Easement and Maintenance Covenant
- _____ Itemized Stormwater Management Construction Estimate.
- _____ Storm drain plans for any areas not draining directly to the facility (must show safe structural conveyance).

SOILS INVESTIGATION

- _____ Geotechnical report
- _____ Minimum boring locations: a minimum depth of 4 feet below proposed bottom of facility and for infiltration at least one every 50 linear feet
- _____ USDA textural classification for various layers, with depth
- _____ Depth to the seasonal high groundwater and bedrock (proposed bottom of facility to be a minimum of 4 feet above both)
- _____ Fill areas identified
- _____ In-place percolation test (for infiltration only)

FILTRATION COMPUTATIONS

- _____ Drainage area to the facility
- _____ Volume of storage required and provided
- _____ Submit flow splitter computations (if applicable)
- _____ Correct determination for compliance with MD-378. For facilities subject to MD-378, reference MCDPS Pond Plan checklist

For Infiltration

- _____ Use .40 void ratio for gravel
- _____ Use 3-inches/hour maximum infiltration rate for computations regardless of actual percolation rate. For rates that are exceedingly high (>10-inches/hour) investigate use of alternative filtration practice
- _____ Maximum depth determination
- _____ Facility dimensions

For Sand Filtration and Biofiltration

- _____ Minimum surface area of filter
- _____ Facility dimensions

_____ For structural sand filters, use .40 void ratio for sand

_____ Structural computations. Comps must be signed/sealed by a registered professional engineer with all assumptions noted in the comps

_____ Storage computed above the sand for surface sand filter

For Stormfilters

_____ Copy of the sizing computations sent to Stormfilter

STORMWATER MANAGEMENT PLAN

A. PLAN VIEW OF FILTRATION FACILITY

_____ Existing and final contours (1-foot or 2-foot interval)

_____ Existing and proposed improvements with elevations

_____ Location of test borings

_____ Existing and proposed utility location/protection

_____ Delineation of easement area around the filtration facility and filter devices/areas... Include flow splitters and outfalls. Minimum 10-foot clearance around the facility.

_____ Access to a public right-of-way (minimum 12-feet wide)

_____ Location and clear access to the observation well(s)

_____ Safe building locations and basements (minimum 20-feet away)

_____ Safe conveyance of filtration overflows ...storm drain outlet(s) should be located away from overflow outlet

_____ Method for preventing construction sediment from entering the facility

_____ Method for permanent filtering of runoff prior to entry into the facility (ie. Outlet to a grass buffer or swale for pre-treatment)

_____ Inflow improvements (appropriate details required)

_____ Non erosive outfalls provided (appropriate details required)

For Stormfilters

_____ Show correct location and angle of incoming and out going pipes

_____ Show correct number of canisters

_____ Ladder must be shown with clear access to the floor

_____ Type of material in canisters

B. CROSS-SECTION AND PROFILE THROUGH FILTRATION FACILITY

_____ Existing and proposed grade specific to each facility

_____ Observation well/cleanout location(s) (centered)

_____ Watertight, removable cap on observation well/cleanout

For Infiltration Trenches

_____ Trench depth – give elevations and inverts

_____ Gravel size: 1 – ½ to 3 inch; clean, washed material

_____ 6-inches of clean, washed sand (ASTM C-33) on bottom of trenches

_____ Provide 12-inch pea gravel surface layer. Use Mirafi 140-N or DPS approved equivalent between pea gravel and 1 ½ - 3 inch gravel

_____ Filter cloth specifications (ie. Mirafi 140N or DPS approved equivalent) and location (top and sides of facility only)

_____ Storm drain system connection (if applicable)

_____ Top of trench open to surface

_____ Embankment side slopes labeled and top width clearly shown (3:1 side slopes, 4-foot minimum top width)

_____ Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Surface Sand Filters

_____ Facility depth – give elevations and inverts

_____ Filter media specification – ASTM C-33 fine aggregate concrete sand (washed), MSHA #7 gravel

_____ Location(s) of 6-inch PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along with length, spacing and slope

_____ Underdrain to be Sch. 40 PVC with a minimum of 6-inches of gravel above the pipe, 3-inches of gravel below the pipe

_____ Underdrain perforated with 3/8-inch diameter holes at 4-inches on center every 90 degrees. Perforated sections within gravel layer only

_____ Embankment side slopes labeled and top width clearly shown (3:1 maximum side slopes, 4-foot minimum top width)

_____ Core trench around underdrain and underneath embankment fill clearly labeled (bottom width 2-feet minimum, side slopes 1:1 maximum, depth 2-feet minimum)

_____ Anti-seep collar location shown for the underdrain (if required). Anti-seep collar not required for underdrains ≤ 6-inch diameter

_____ Outfall protection shown, including dimensions, slope (0.00%), and median rip rap size (d_{50}), thickness, approved filter fabric or geotextile as appropriate

_____ Elevations (including required freeboard) for top of dam, 10-year WSEL, water quality storage, riser/weir crest and top of sand filter. Weir crest to be located at existing ground or in cut

_____ Freeboard: top of dam minimum 1-foot above 10-year WSEL with overflow weir or 1-foot above 10-year HGL at flow splitter when no weir is provided

_____ Storm drain system connection shown (flow splitter and main line connections)

_____ For surface sand filters subject to MD-378 – reference MCDPS Pond Plan Checklist

Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Structural Sand Filters

Facility depth – give elevations and inverts

Filter media specification: clean ASTM C-33 fine aggregate concrete sand, MSHA #7 gravel

Location(s) of 6-inch PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along with the length and spacing

Underdrain to be Schedule 40 PVC with a minimum of 6-inches gravel cover above the pipe

Underdrain perforated with 3/8-inch diameter holes at 4-inches on center every 90 degrees. Perforated sections within gravel layer only

Geotextile fabric provided between the top gravel layer and the sand layer. Use Tensar TM-3000, Enkamat 7020 or DPS approved equivalent.

Length and width of settling area, filter area, and clearwell area

Storm drain system connection shown (flow splitter and main line connections)

Safe bypass of overflows

Elevations of 10-year WSEL, water quality storage and top of filter

Facility must be designed by a licensed structural engineer. Copy of structural computations provided and signed structural certification on plan

Facility provides adequate accessibility and headroom for maintenance (personnel access manholes, removable grates or doors, and steps provided)

For Biofiltration

Maximum drainage area to a single facility between 0.25 and 1 acre. Multiple facilities required for drainage areas greater than 1 acre

Facility depth – give elevations and inverts

Filter media: mulch layer, planting media, sand windows, with appropriate dimensions noted

Planting soil noted as 1/3 perlite or solite, 1/3 compost, 1/3 onsite soil

Location(s) of 6-inch SCH 40 PVC underdrain and associated cleanouts with perforated vs non-perforated sections clearly shown along the length with a minimum of 6-inches of gravel above the pipe, 3-inches of gravel below the pipe

12-inch maximum ponding depth

Storm drain system connection shown

Safe bypass of overflows

Embankment side slopes labeled and top width clearly shown (3:1 maximum side slopes, 4-foot minimum top width)

Elevations for top of berm (provide minimum 6-inches freeboard between water quality storage elevation and top of berm), 10-year WSEL, water quality storage elevation, riser/weir crest and top of biofiltration facility

Landscape plan prepared by a landscape architect registered in the state of Maryland.

For Stormfilters

____ Provide all elevations and dimensions

C. **MISCELLANEOUS ITEMS**

____ Appropriate construction specifications

____ Inspector checkoff list (specific to each facility)

____ Seepage analysis if required

____ Sealed by P.E. (structural P.E. also where required) with signature and date.

____ MCDPS Turf Reinforcement detail on plan

____ MCDPS Shallow Facilities Specifications on plan



Water Quality Storm Drain Unit Plan Review Checklist

Sediment Control Permit No. _____

SUPPORTING INFORMATION

- ____ Maintenance Easement and Covenant
- ____ Itemized Stormwater Management Construction Estimate.

GENERAL PLAN REQUIREMENTS

- ____ Delineation of outfall or immediate downstream storm drain system.
- ____ Facility and manhole location to allow easy access and maintenance.
- ____ Maintenance access from public right-of-way, minimum width 12 feet, maximum grade 15% if mechanically stabilized, 10% maximum without mechanical stabilization.
- ____ Maintenance easement (must include the unit; any related appurtenances; access points; flow splitting structures; inlet trash racks).
- ____ Loadings for structural design specified on plan (H-20 for vehicular areas).
- ____ Details shown on plan for a specific model.
- ____ Model dimensions -- Give all variables.
- ____ If feasible, locate the unit on a lateral or local storm drain line, rather than on a trunk line.
- ____ Gasket detail on plan.
- ____ Give top slab and MH rim elevations.
- ____ Nine (9) inch maximum height for manhole frame.
Secure manhole rim to the top slab (Use WSSC detail S/4.3)
- ____ All inlets draining to the unit must have surface debris trapping devices with openings < 6-inches in diameter unless drainage passes through a flow splitter trash rack before entering the unit. Trash racks on public storm drains are not permitted. Debris trapping devices are to be included in the maintenance easement and covenant documents.
- ____ Do not use as a sediment trapping device.

FORMS AND NOTES

- ____ Standard Notes
- ____ Provide installation/construction instructions
- ____ Provide procedure to seal lift holes
- ____ Maintenance notes

Stormceptor Review Requirements

_____ Bypass area above the weir adequate to pass Q_{10} .

_____ Include 24-inch down pipe installation procedure for STC-2400, STC-3600, STC-4800, STC-6000, STC-7200.

_____ Two manholes are required if there is less than 3-feet of clearance between the drop inlet pipe and the bottom of the top slab.

_____ If < 4-feet between pipe invert and proposed grade, submit verification from the manufacturer that construction of the unit is possible.

_____ Show pipe and insert dimensions – pipe type, inverts, exactly one inch difference between the inlet invert and the outlet invert. On a two inlet pipe design, there should be exactly 3-inches difference.

_____ No inlet/outlet pipe >36 inches without customization of the insert design.

_____ One inlet and one outlet pipe preferred. Two inlet pipes are the maximum allowed.

_____ Provide procedure for drop pipe installation.

_____ Order form with completed sizing information for each unit on plans. Manhole rim elevation specified on the order form.

_____ Note that dimensional shop drawings are to be approved by the design engineer and accepted by DPS prior to fabrication. The dimensional shop drawings must be reviewed and signed off by the engineer prior to submittal to DPS.

STORMCEPTOR SIZING

_____ For primary water quality, size for a minimum 80% TSS removal rate using the latest Stormceptor sizing guidelines.

_____ Total drainage area to the unit shown clearly in the computations.

_____ Use "Bethesda" or "Frederick" rainfall data, whichever is closest.

_____ Use "Fine" particle size.

BaySaver Review Requirements

_____ Sizing computations. For primary water quality, size so that the flow rate of the required water quality volume is at or below the "Low Flow Capacity". Other sizing may be used if the unit serves as pretreatment only. Do not size per impervious drainage area.

_____ Show detail of downstream storm drain connection.

_____ Shop drawing is not required for BaySaver.

_____ Detail dimensions are accurately reflected in the dimension table on the plan.



Underground Stormwater Management Facility Plan Review Checklist

Sediment Control Permit No. _____

SUPPORTING INFORMATION (One Copy)

- _____ Maintenance Easement and Covenant Documents
- _____ Itemized Stormwater Management Construction Estimate.
- _____ Storm drain plans and computations for storm drains leading to the underground facility.

STORMWATER MANAGEMENT COMPUTATIONS (One Copy)

- _____ RCN determinations for CP_V: ultimate development (any existing developed off-site areas considered as existing condition).
- _____ Stormwater Management provided for one half of contiguous rights-of-way or planned non-state roads, and new construction within state road rights-of-way.
- _____ Time of Concentration (T_C) for CP_V computations: ultimate development (same policy on existing off-site areas as RCN determination).
- _____ Elevation-storage computations.
- _____ Elevation-discharge computations (provide equations and site references).

STORMWATER MANAGEMENT PLAN (One Copy)

A. PLAN VIEW OF FACILITY AT SCALE OF 1" = 50' OR LESS (40', 30', ETC.)

- _____ Existing and final contours (1' or 2' interval)
- _____ Existing and proposed improvements.
- _____ Delineation of outfall or downstream storm drain, control structure, storage facility and entire storm drain system.
- _____ Facility and manhole location to allow easy access and maintenance.
- _____ Outflow pipe, outlet protection (detail required), outfall channel.
- _____ Existing and proposed utility locations.
- _____ Maintenance access from public right-of-way, minimum width 12', maximum grade 15% - mechanically stabilized, 10% maximum without mechanical stabilization.
- _____ Maintenance easement (shall include: storage chamber, control structure, outfall, any related appurtenances, access points, minimum width allowance for repair work. Minimum 10-foot clearance around the facility.

B. PROFILE OF ENTIRE SYSTEM AND ASSOCIATED DETAILS

1. GENERAL ITEMS

- _____ Only pipes and concrete vaults allowed for storage chambers.

_____ Circular pipes only.

_____ All slopes, inverts, and dimensions.

_____ Minimum 48" height of storage chamber and cross-overs.

_____ Gage and corrugation size for metal pipe. Minimum 14 gauge.

_____ Silt tight pipe or storage chamber.

_____ Coupling band detail.

_____ Grated, vented manholes on upstream and downstream ends of storage chamber for access, cleaning, and venting.

_____ Maximum of 100' chamber length between manhole access points.

_____ For metal pipe, add note that the pipe ends must be matched and numbered, from the manufacturer.

_____ Concrete manholes must be used at all HDPE pipe connections.

3. CONTROL STRUCTURE (DETAILS REQUIRED)

_____ Reinforced concrete only (shop drawings for precast structures need approval of the design engineer and acceptance by MCDPS prior to fabrication). Add note to that effect on the plan.

_____ Plan view with top slab removed.

_____ Cross-sections each direction.

_____ Top slab reinforcing detail.

_____ Reinforcing details for all cast-in-place concrete structures.

_____ Submit copy of structural computations if cast-in-place.

_____ Weir crest and CpV and 10-year water surface elevations.

_____ Orifice dimensions and location.

_____ Orifice trash rack.

_____ Protective coating for exposed metals.

_____ Manhole access to both sides.

_____ Maximum manhole step spacing of one foot on center. Access ladders must be used.

3. OUTFALL PROTECTION (DETAIL REQUIRED)

_____ Size for 10-year storm – use SCS methodology.

_____ Cross-section at end of channel in accordance with receiving section.

_____ Outfall dimensions.

_____ Slope – 0%

_____ Median riprap size (d_{50}).

_____ Thickness ($2.0 \times d_{50}$)

____ Approved filter cloth.

C. MISCELLANEOUS ITEMS

____ Inspector Checkoff List / Sequence of Construction

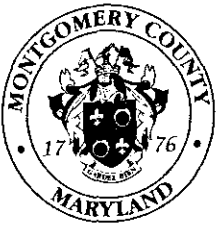
____ Stormwater Management Construction Specifications and General Notes.

____ Water quality considerations and construction runoff protection.

____ Loadings for structural design specified on plan (H-20 for vehicular travel areas).

____ Sealed by P.E. (Structural P.E. also where required) with signature and date.

January 2005



Erosion and Sediment Control Plan Review Checklist

Project Name: _____ Engineer/Phone No. _____

Sediment Control Permit No : _____

SWM File No.: _____ Assigned/Phone No. _____

Plan Type: _____

Legend:

INC Incomplete/Incorrect
N/A Not Applicable
SC Sediment Control
SWM Stormwater Management
FPDP Floodplain District Permit
DA Drainage Area
SPA Special Protection Area

Submittal Date

Review Date

Initial

Design Acceptable

Date

These checklists have been designed to provide specific instruction to engineers. All items are expected to be addressed in the first submittal. Failure to do so will result in less than a full first review. If any items marked with an asterisk (*) are not addressed, no further review of the first submittal will be made. The plan will be returned to the engineer for completion and will have to be resubmitted for a new first review. (Review fees already paid will be credited).

TO THE ENGINEER:

Your submission for plan approval has been reviewed. The review was made per the following checklists. **Please return the checklist and plan comment sheets with your resubmittal.** If you do not address a checklist item, including comments on the sediment control plan sheets, explain your reasoning in your transmittal letter.

SUPPORTING INFORMATION

* _____ Transmittal **specifically** explaining the purpose of the submission.

_____ Completed Sediment Control/Stormwater Management Design Plan Information Form (IF-1).

* _____ Stormwater Management Requirements: MCDPS concept approval letter on plan.

* _____ Copy of the storm drain plans to be used by the storm drain contractor, to check consistency with the sediment control and stormwater management plans.

SEDIMENT CONTROL PLAN

- ____ Scale (1" = 50' maximum), north arrow.
- * ____ Existing and proposed topography (2' contour intervals maximum).
- ____ No permanent cut or fill slope with gradient steeper than 3:1 is permitted in lawn maintenance areas or on private lots. A slope gradient of up to 2:1 is permitted in low maintenance areas provided that those areas are indicated on the SC plan and specific low-maintenance ground cover is called for.
- ____ Composite sheet for plans covering two or more separate sheets, showing schematic SC.
- ____ Title Block: Legal subdivision and common name with lots/blocks, parcels, liber/folio, or other legal references; station numbers for road projects; indicate **grading only** or **streets only**, as applicable. Include Standard Rough Grading Notes if applicable.
- ____ 3" x 10" MCDPS Approval Block in the lower right-hand corner of all sheets.
- ____ Owner/Permit Applicant name, address, phone number, and contact person on first sheet.
- ____ Vicinity map with site outlined (1:2,000 scale) on first sheet.
- ____ All sheets of final SC package numbered consecutively: Sheet # ____ of # ____.
- ____ Sealed by P.E., L.S., or architect on the first page of the plans, with date and signature.
- ____ Property lines and owner/legal description for adjacent properties.
- ____ Match lines corresponding sheet to sheet.
- ____ Certifications: Owner/Developer; Design; Cut/Fill/Disturbed Area. Include Stormwater Management Maintenance certification as appropriate. Plan revisions which increase the disturbed area require an updated Cut/Fill/Disturbed Area certification.
- ____ Disturbed area outlined and labeled. All SC devices must be shown within the disturbed limits.
- ____ Existing and proposed tree lines or individual trees labeled on all SC plan view sheets. Show Forest Conservation Easement and tree save areas per the approved Forest Conservation plan.
- * ____ Existing and proposed drainage divides on SC plan view sheets.
- ____ Offsite drainage area (acres) entering site on SC plan view sheets.
- ____ Show and label existing and proposed improvements (utilities, streets, buildings, etc.) on SC plan view.
- ____ Any designated wetlands (including 25-foot buffer) delineated on the SC plan view sheets.
- ____ Copy of approved State Wetlands permit.
- ____ 100-year floodplain and 25-foot BRL delineated on SC plan view sheets for any drainage way with >30 acre drainage area. No disturbance or structures permitted in this floodplain without MCDPS Floodplain District Permit (FPDP).
- ____ Approved MCDPS Floodplain District Permit, if applicable. Also if applicable, need State Waterway Construction Permit prior to FPDP issuance. **NOTE:** SC plans may be approved, but no permit will be issued until FPDP is issued.
- ____ "Related Required Permits" table completed and placed on the first SC plan sheet.
- ____ Label all SC devices.

_____	_____	_____	Sediment trap(s): need safety fence; inflow point protection (PSD's required for drainage areas >3 acres), proper outlet location (maximizing flow length from inflow points); dewatering as necessary (include MCDPS dewatering device detail); and baffles (required for drainage areas >3 acres: include MCDPS baffle detail). Provide trap data information on the SC plan sheet as follows: trap type; existing DA; developed DA; storage required; storage provided; weir crest elevation; storage depth; bottom dimensions; cleanout elevation; channel depth of flow; maximum sideslopes (specify cut and/or fill); bottom elevation; embankment elevation; riser dimensions; barrel dimensions. Pipe outlet traps require separate dewatering device. Stone Outlet Sediment Traps (ST-II, ST-IV) are not allowed in Montgomery County.
_____	_____	_____	Sediment basin(s): include sediment basin design and construction information as required by "Maryland State Standards and Specifications"; Low Hazard Class assured; barrel outfall cross-section; MCDPS CMP band and dewatering device detail; inflow point protection; safety fence. Show baffles as necessary. Show and address construction access and stockpiling on the SC plan and address sediment control during basin installation. Limit initial disturbance to installation of the principle spillway. If there is a baseflow, provide a clean water diversion; if there is no base flow, provide diversion dikes above the disturbed area.
_____	_____	_____	No SC devices are to be located within 20 feet of building foundations.
_____	_____	_____	Protection of interior tree save and undisturbed areas shown on plans.
_____	_____	_____	Temporary storm drain diversion: detail in Sequence of Construction, show profile, give invert elevations of temporary pipe into trap on plan view, profile, and details; and show the diversion on the storm drain plan.
*	_____	_____	Sequence of Construction: use MCDPS Standard Sequence [Forest Conservation Law (FCL) and Non-FCL] and expand to fit the specific needs of each site.
_____	_____	_____	Standard Sediment Control Notes including MISS UTILITY note.
_____	_____	_____	Standard details for SC devices.
_____	_____	_____	Offsite grading requires documentation of permission from owner (letter of permission on plan or recorded grading easement document submitted).
_____	_____	_____	Any work on MNCPPC property must have Parks Engineer approval.
_____	_____	_____	Adequate access, staging, and stockpile areas shown on the plan with appropriate sediment control for each.
_____	_____	_____	Note on first plan sheet that "Prior to vegetative stabilization, all disturbed areas must be topsoiled per the Montgomery County "Standards and Specifications for Topsoil". Specifications must be on the plans.

STORM DRAIN SYSTEM (Show items on SC plan).

_____	_____	_____	Plan view of storm drain system with topography to 100-feet below each outfall, showing dimensions, Q_{10} , V_{10} , d_{50} , and MSHA class.
_____	_____	_____	All outfalls must release runoff to an existing system, adequate receiving channel, or slope $\leq 2\%$. Provide profiles of outfalls showing rip-rap slope, length, d_{50} , MSHA class, and V_{10} at pipe outfall.
_____	_____	_____	Provide outfall cross-section detail(s) with the following information specific to each outfall: shape conforming to receiving channel; outfall dimensions, rip-rap size (d_{50}) and MSHA class; embedded depth ($2.0 \times d_{50}$); and filter cloth underneath.

CHANGE OF OWNERSHIP

- ___ ___ ___ Sediment control maintenance agreement completed and a copy placed on the SC plan.
- ___ ___ ___ All areas pertaining to new ownership clearly identified on plan.
- ___ ___ ___ Title blocks reflect revised legal description.

MISCELLANEOUS

- ___ ___ ___ Safe conveyance to previously approved central/regional facility, if applicable.
- ___ ___ ___ Site in conformance with preliminary plan and/or site plan requirements and forest conservation plan.
Copy of approved preliminary plan, site plan with opinion, and forest conservation plan or exemption letter must be received prior to plan approval.
- ___ ___ ___ Stormwater management waiver fee: Submit a plan showing the waived area(s), and give the percent impervious and total waiver area in acres (if not using pre-set fees for single family zones).
- ___ ___ ___ For SPA sites, monitoring fee paid. NOTE: Fee must be paid prior to plan approval.
- ___ ___ ___ For SPA sites, place a copy of the SPA notice on the first plan sheet.
- ___ ___ ___ For SPA sites, place a copy of the monitoring requirements on the plans.



Stormwater Management Pond Plan Review Checklist

Sediment Control Permit No. _____

SUPPORTING INFORMATION (One Copy)

- _____ Pond Summary Sheet (NRCS MD-ENG-14) (signed copy from NRCS)
- _____ Maintenance Easement and Covenant Documents
- _____ Itemized Stormwater Management Construction Estimate.
- _____ Storm drain plans for any areas not draining directly to the pond (must show safe structural conveyance).

STORMWATER MANAGEMENT COMPUTATIONS

A. HYDROLOGY

- _____ RCN determinations for CP_v : ultimate development (any existing developed off-site areas considered as existing condition).
- _____ Time of Concentration (T_C) for CP_v computations: ultimate development (same policy on existing off-site areas as RCN determination).
- _____ For safety storm routings (10-year, 100-year), RCN and T_C determinations must be based on the entire drainage area under ultimate development conditions, per zoning.
- _____ Compute channel protection volume (CP_v)
- _____ Use 24-hour extended detention for Class I watersheds. Use 12-hour for Class III and Class IV watersheds.
- _____ Hydrograph and NRCS TR-20 routing for appropriate ultimate development (including off-site areas) safety storms (criteria from MD-378, Table 1).
- _____ "Safety Check" storm routing is required if any low flow openings of 6-inches or smaller in any direction are called for in the design. Low flow openings of 6-inches and smaller in any direction must be considered blocked for a separate routing of the 100-year storm. The routing must start at an opening greater than 6-inches in all directions, and the resultant water surface elevation must not overtop the embankment.

B. ASSORTED COMPUTATIONS

- _____ Design narrative
- _____ Written "Dam Hazard Classification" statement.
- _____ Elevation-Storage (include graph and table)
- _____ Required and provided permanent pool volume, if applicable.
- _____ Channel protection volume and discharge.
- _____ Elevation-Discharge (provide equations and cite references).
- _____ Check for barrel control prior to riser orifice flow.
- _____ Anti-seep collar design.

_____ Flotation analysis (factor of safety = 1.2:1).

_____ Pond drain drawdown (24 hours maximum from permanent pool).

_____ Danger reach study, if required.

GEOLOGICAL INVESTIGATION (One Copy)

_____ Geotechnical report with construction/design recommendations.

_____ Minimum boring locations: borrow area; pool area; principal spillway; top of dam near one abutment or emergency spillway, if provided.

_____ Boring logs with Unified Soil Classification, blow counts and soil descriptions.

_____ If groundwater is within 1 foot of the proposed bottom of a dry pond, drain tile is required.

STORMWATER MANAGEMENT PLAN

A. PLAN VIEW OF POND AT SCALE OF 1" = 50' OR LESS (40', 30', ETC.)

1. GENERAL ITEMS

_____ Existing and final contours (1' or 2' interval).

_____ Existing and proposed improvements

_____ Delineation of permanent, extended detention, 10- and 100-year pools. If the 10-year exits the emergency spillway, 5-year water surface elevation must be delineated.

_____ Locations of test borings

_____ Outflow pipe, outlet protection (detail required); outfall channel.

_____ Inflow improvements (appropriate details required); storm drains carried to normal pool (wet) or pond bottom (dry), with appropriately sized rip rap outfalls transitioning to low flow channel dimensions.

_____ Low Flow Channel required for all ponds: bottom width = pipe diameter; minimum of 1' depth and 2' wide flat bottom; inverts at 50-foot intervals; details required. Stabilize with grass and turf reinforcement material.

_____ Emergency spillway level section and outlet channel.

_____ Existing and proposed utility location/protection. Pipes and utilities not parallel to the axis of the dam shall meet all principal spillway requirements. Pipes and utilities parallel to the axis of the dam shall be constructed with no granular bedding.

_____ Ponding and/or pond slopes on private property must have easements.

_____ MCDPS Turf Reinforcement detail on plans.

2. MAINTENANCE ITEMS

_____ Maintenance access from public right-of-way or publicly traveled road (e.g. private road in a townhouse project): minimum width 12-feet, no steeper than 10% (15% if mechanically stabilized). Provide MCDPS standard driveway apron at access point to facilities located in greenspace.

_____ Maintenance Easement (Shall include riser structure, embankment, outfall, 100-year ponding area, access, , adjacent property as necessary. Show easement on plan view. Minimum 10-foot clearance around the facility.

_____ Minimum permanent pool depth 4-feet (except wetland ponds).

Submerged pond bank slope 3:1.

Forebay (if required).

Dry pond bottom sloped no flatter than 2% to a low flow channel.

Slopes – No steeper than 3:1 anywhere around the pond (except where natural topography is preserved or for the downstream toe of a dam used as a public roadway). Slopes above the permanent pool of a wet pond no steeper than 4:1, 3:1 with safety bench*, or 2:1 if natural topography is preserved and a safety bench* is provided.

*Bench must be a minimum of 15-feet wide and 1-foot above the permanent pool elevation or at the extended detention pool elevation, if provided.

B. LANDSCAPING / MULTIPLE USE / AESTHETIC CONSIDERATIONS

Landscaping plan required (low maintenance vegetation on steep slopes, only approved shrubs and bedding stock on the dam, optional reforestation outside the 2-year pool, aquatic plantings, etc.) If the embankment will serve as a roadway, refer to MD-378 for planting requirements. Clearly delineate the areas of the pond that are to remain in turf grass, including the embankment setbacks and the pond access area.

Use natural, variable looking slope shapes.

Landscape plan prepared and sealed by a landscape architect registered in the state of Maryland.

C. PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS

1. EXISTING AND PROPOSED GROUND

Dam side slopes labeled.

Top width (from MD-378, minimum 10-feet)

2. FOUNDATION CUTOFF (CORE TRENCH)

Bottom width (4-feet minimum)

Side slopes (1:1 maximum slope)

Depth (4-feet minimum)

Material to be GC, SC, CH or CL

3. IMPERVIOUS CORE (ZONED FILL / EMBANKMENT CORE)

Top width (4-feet minimum)

Side slopes (1:1 maximum)

Height (extend at least up to the 10-year water surface elevation)

Material to be GC, SC, CH or CL

4. BARREL

Must be concrete for diameters less than or equal to 48-inches; all concrete barrels must be labeled as meeting ASTM C-361; all barrels must be circular, with the following information provided: inside diameter, class, length, and slope.

Bedding (cradle) for concrete barrels (Detail required). Must extend at least to the spring line of the pipe, and a minimum thickness of 6-inches below the pipe.

First pipe joint to be located within four feet of the riser face, but not less than two feet.

5. RISER OR SIMILAR STRUCTURE (SPECIFIC DETAIL REQUIRED)

To be same material as the barrel.

To be poured or pre-cast. If pre-cast, provide standard shop drawing note.
"Shop drawing must be approved by the engineer and accepted by MCDPS prior to fabrication".

Cast-in-place concrete collar (for pre-cast risers only). Detail required.

All structure dimensions.

Structural details for cast-in-place structures.

High stage trash rack (removable, hot dipped galvanized, minimum #6 rebar on 8-inch centers both ways with vertical bars on the outside), or MCDPS approved alternative.

Bolted 30-inch diameter manhole covers.

Anti-vortex device (detail needed if required)

Maintenance access.

Structural computations (signed and sealed) for cast-in-place designs.

6. ORIFICE(S) AND TRASH RACKS (DETAIL REQUIRED)

Dimensions

Wet or wetland ponds: non-clogging, non-hydraulically interfering inlet drawing water from at least one foot below permanent pool and 50% of total depth above pond bottom (e.g. corrosion resistant, removable hood; turned down elbow, or reverse slope pipe hidden in dam)

Dry pond: For orifice(s) \geq 6-inches; removable, hot dipped galvanized (or MCDPS approved alternative), minimum #6 rebar trash rack with an area \geq 6 times the protected opening area; 4:1 upstream face, maximum bar spacing = 6-inches, and vertical bars on the outside. If < 6-inches, use expanded galvanized steel grate. Orifice size <2-inches not allowed without specific permission of MCDPS.

7. POND DRAIN (for wet ponds only)

Ductile iron or concrete pipe.

Easily accessible, non-clogging, reseating valve

Inlet prevents uptake of sediment (removable elbow)

Extend valve stem to the top slab of the riser.

8. ANTI-SEEP COLLARS (DETAIL REQUIRED)

Size – 15% increase in L_s using outside pipe diameter

Spacing and location on barrel

Labeled as being located at least 2-feet from a pipe joint

Material and method of connection

Phreatic line (4:1 slope): measured from the intersection of the dam and a horizontal projection of the 10-year water surface elevation.

9. **OUTFALL PROTECTION (DETAIL REQUIRED)**

Size for maximum barrel release (but not greater than 10-year storm)

Cross-section at end of the channel in accordance with receiving section

Outfall dimensions

Slope – 0%

Median rip-rap size (d_{50})

Thickness ($2.0 \times d_{50}$)

Approved filter cloth

10. **ELEVATIONS: (INCLUDES REQUIRED FREEBOARD)**

Top of dam (1-foot freeboard above 100-year pool with an emergency spillway, 2-feet without)

Crest of emergency spillway (2-feet minimum below top of settled embankment)

Crest of riser (1-foot minimum below crest of emergency spillway, if provided)

Pools: permanent, extended detention and appropriate safety storms

Inlet and outlet inverts of pipes, percent slope

D. **PROFILE SECTION OF DAM ALONG CENTERLINE**

Existing ground

Proposed grade

Top of dam (constructed and settled) - add 5% additional fill to account for settlement

Location of emergency spillway with side slopes labeled

Bottom of core trench (4-foot minimum)

Top of impervious core (zoned fill)

Barrel location

Existing and proposed utility location/protection. Pipes and utilities not parallel to the axis of the dam shall meet all principal spillway requirements. Pipes and utilities parallel to the axis of the dam shall be constructed with no granular bedding.

All excavation for pipe spillways, whether into existing or natural ground, shall have side slopes of 2:1. Foundation cutoff trench side slopes shall be 1:1 in profile and dam centerline cross section.

E. **EMERGENCY SPILLWAY PROFILE ALONG CENTERLINE**

Existing ground

Inlet, level (control) and outlet sections

Spillway crest elevation

Design must be per NRCS references.

F. MISCELLANEOUS ITEMS

_____	_____	_____	Inspector Checkoff List / Sequence of Construction
_____	_____	_____	Soil logs on plan
_____	_____	_____	100-year floodplain (MCDPS Floodplain District Permit required for pond D.A.'s ≥ 30 acres)
_____	_____	_____	MCDPS Pond Construction Specifications
_____	_____	_____	Sealed by P.E. (Structural P.E. also where required) with signature and date.

Items to Check at As-Built For Stormceptor™ Units

- Structure constructed within the recorded stormwater management easement (get a field location).
- Correct structure size installed (i.e., STC-900, STC-1800, etc.).
- A copy of the recorded easement/covenant is in the stormwater management file.
- If the storage chamber has a riser section within it (STC 1800, STC 3600, STC 4800, STC 6000, STC 7200), was the riser section installed? Verify total depth of the structure.
- Verify type, size, invert and number of storm drain pipe connections. Verify that rubber boot connections were used if called for on the plan (usually required with any smooth outside diameter pipe 36-inch I.D. or smaller).
- Proper number of manholes in top slab (shallow structures require two 30-inch manholes).
- Copy of the completed Inspector Check-Off List(s) submitted.
- Completed IF-1 Form.

Items to Check at As-Built For Baysaver™ Units

- Structure constructed within the recorded stormwater management easement (get a field location).
- Correct structure size installed.
- A copy of the recorded easement/covenant is in the stormwater management file.
- Verify that the storage manhole is in proper vertical relationship to the splitter manhole, and verify total depth of the storage manhole.
- Verify type, size, invert and number of storm drain pipe connections. Verify that the concrete collar was installed at the terminal storm drain connection as called for on the plans.
- Copy of the completed Inspector Check-Off List(s) submitted.
- Completed IF-1 Form.

Montgomery County Department of Permitting Services
Stormwater management structure
Shop drawing review checklist

PROJECT NAME #: _____ **Sediment Control Permit #:** _____

SWM Structure #: _____ **SWM File #:** _____

This checklist is to be completed by the civil engineer submitting shop drawings for acceptance by MCDPS. The precaster is to send the shop drawings with structural computations to the civil engineer after plan approval, but prior to construction. The design civil engineer must review and approve the shop drawings per this checklist and submit it, along with two copies of the approved shop drawings, to the Water Resources Section of MCDPS. This checklist must be accepted by MCDPS prior to fabrication of the structure.

When certifying the correctness of shop drawings for acceptance by MCDPS the following (at a minimum) must be verified by the design civil engineer:

- ☐ Interior dimensions as per the approved plan.
- ☐ Wall and slab thickness as per the approved plan.
- ☐ Correct size, number and placement of openings, orifices and manholes per the approved plan and any precast anchor points necessary for installation of the structure.
- ☐ Structural design certification and P.E. seal by preparer of shop drawing ("I hereby certify that the structural design of this structure is in accordance with applicable codes and that this structure has been designed for the specified loadings as indicated on the plan.")
- ☐ The following notes are to appear on the drawing:
 - ☐ Structure must be watertight.
 - ☐ Annular space between pipe and hole to be filled with an approved non-shrink grout or concrete (as specified). For Stormceptor and Stormfilter, a rubber boot connection is required. Adapters are available for HDPE pipe.
 - ☐ Butyl rubber to be used in all joints. All joints to be grouted with non-shrink grout, inside and out.
- ☐ Structural computations sealed by preparer of shop drawings.
- ☐ Anti-flotation restraints at construction joints (where applicable).
- ☐ Flotation computations (if any dimensions are changed from the approved plan).
- ☐ Steps (if required).
- ☐ Reference on shop drawings that fabrication to be in conformance with the latest edition and addenda of the MSHA Standards and Specifications for Construction and Materials.
- ☐ Other _____

Dimensional conformity with the approved Sediment Control/Stormwater Management plans is essential. Structures whose dimensions differ from the approved SC/SWM plans will be rejected. Dimensional modifications to the structure will not be allowed once the structure has been cast. It is the responsibility of the design engineer to insure the correctness of the shop drawings.

SUBMITTED BY: Firm: _____

Address: _____

Phone #: _____ FAX #: _____

Project Engineer: _____

Prepared By: _____ DATE: _____

CHECKLIST ACCEPTANCE BY MCDPS:

NAME: _____ DATE: _____